WHAT IS CLAIMED IS:

1. A gas turbine combustor comprising a combustor liner contained in a combustor outer casing, which is mounted to a main housing of a turbine, and forming a combustion chamber therein, a transition inner duct for introducing combustion gas generated in said combustor liner, and a transition outer duct disposed around said transition inner duct, wherein:

said transition inner duct and said transition outer duct are disposed in said main housing, inlet openings for causing a fluid introduced from said compressor to flow into a space defined between said transition outer duct and said transition inner duct are formed at both a joint portion between said transition inner duct and said combustor liner and a joint portion between said transition inner duct and said turbine, and said transition outer duct is formed as an extraction flow passage for extracting the fluid having flown in through said inlet openings to the outside.

2. A gas turbine combustor comprising a combustor liner contained in a combustor outer casing, which is mounted to a main housing of a turbine, and forming a combustion chamber therein, a transition inner duct for introducing combustion gas generated in said combustor liner, and a transition outer duct for forming a space between said transition inner duct and said transition outer duct, wherein:

said gas turbine combustor is of the type extracting a fluid compressed by said compressor through said combustor outer casing and supplying, as air for combustion, the fluid having been subjected to heat exchange with gas-turbine exhaust gas in a recuperator, and

said transition inner duct and said transition outer duct are disposed in said main housing, inlet openings for causing the fluid introduced from said compressor, as a fluid for cooling said transition inner duct, to flow into a space defined between said transition outer duct and said transition inner duct are formed at ends of said transition outer duct on both sides nearer to said combustor liner and said turbine, and said transition outer duct is formed as an extraction flow passage for extracting the cooling fluid having flown in through said inlet openings to said recuperator.

3. A gas turbine combustor comprising a combustor liner contained in a combustor outer casing, which is mounted to a main housing of a turbine, and forming a combustion chamber therein, a transition inner duct for introducing combustion gas generated in said combustor liner, and a transition outer duct disposed around said transition inner duct, wherein:

said gas turbine combustor is of the type humidifying a fluid at an inlet of said compressor and a fluid extracted from said main housing and supplying, as air for combustion, the high-moisture fluid having been subjected to heat

exchange with gas-turbine exhaust gas in a recuperator, and

said transition inner duct and said transition outer duct are disposed in said main housing, inlet openings for causing the fluid introduced from said compressor to flow into a space defined between said transition outer duct and said transition inner duct are formed at respective ends of both a joint portion between said transition inner duct and said combustor liner and a joint portion between said transition inner duct and said turbine, and said transition outer duct is formed as an extraction flow passage for extracting the fluid having flown in through said inlet openings to said recuperator.

4. A gas turbine combustor according to Claim 1, wherein one or more second openings communicating with the space defined between said transition outer duct and said transition inner duct are formed in addition to said inlet openings formed at the respective ends of both the joint portion between said transition inner duct and said combustor liner and the joint portion between said transition inner duct and said turbine.

5. A gas turbine combustor according to Claim 4, wherein said second openings are formed as openings to supply a fluid to a space area in which the fluids having flown in through said inlet openings formed in said transition outer duct in positions corresponding to both the joint portion between said transition inner duct and said

combustor liner and the joint portion between said transition inner duct and said turbine strike against each other and fluid flows stagnate.

6. A gas turbine combustor according to Claim 4, wherein said second openings are formed as a plurality of openings positioned to be able to cool said transition inner duct by impingement cooling.

7. A gas turbine combustor according to Claim 1, wherein a first partition member for partitioning a space in said main housing and a space in said combustor outer casing from each other is disposed at the joint portion between said transition inner duct and said combustor liner, a second partition member is disposed at a joint portion between said transition outer duct formed as an extraction flow passage for the fluid having flown in through said inlet openings and a flow passage for supplying the fluid introduced through said extraction flow passage to the outside of said main housing, thereby partitioning the space in said main housing and a space in said flow passage from each other, said transition inner duct and said transition outer duct are contained in said main housing such that said main housing can be inserted and withdrawn in the axial direction, and said first and second partition members can be inserted and withdrawn externally of said main housing.

8. A gas turbine combustor according to Claim 1,

wherein bypass holes for supplying a part of the fluid delivered from said compressor while bypassing the space defined between said transition outer duct and said transition inner duct are formed in said transition outer duct.

9. A gas turbine comprising a compressor for compressing a fluid, a combustor for burning the fluid compressed by said compressor and fuel, and a turbine driven by combustion gas generated in said combustor, wherein:

said combustor comprises a combustor liner for forming a combustion chamber therein, a transition inner duct for introducing the combustion gas generated in said combustor liner to said gas turbine, and a transition outer duct disposed around said transition inner duct, said combustor, said transition inner duct, said transition outer duct and said turbine being contained in a main housing of said turbine, said combustor liner being contained in said combustor outer casing mounted to said main housing, and

said transition inner duct and said transition outer duct are disposed in said main housing, inlet openings for causing a fluid introduced from said compressor to flow into a space defined between said transition outer duct and said transition inner duct are formed at respective ends of both a joint portion between said transition inner duct and said combustor liner and a joint portion between said transition inner duct and said turbine, and said transition outer duct is formed as an extraction flow passage for extracting the

fluid having flown in through said inlet openings to the outside of said main housing.

10. A recuperated gas turbine comprising a compressor for compressing a fluid, a recuperator for performing heat exchange between the fluid compressed by said compressor and gas-turbine exhaust gas, a combustor for burning the fluid having passed said recuperator and fuel, and a turbine driven by combustion gas generated in said combustor, wherein:

said combustor comprises a combustor liner for forming a combustion chamber therein, a transition inner duct for introducing the combustion gas generated in said combustor liner to said gas turbine, and a transition outer duct disposed around said transition inner duct, said combustor, said transition inner duct, said transition outer duct and said turbine being contained in a main housing of said turbine, said combustor liner being contained in said combustor outer casing mounted to said main housing, and

said transition inner duct and said transition outer duct are disposed in said main housing, inlet openings for causing a fluid introduced from said compressor to flow into a space defined between said transition outer duct and said transition inner duct are formed at respective ends of both a joint portion between said transition inner duct and said combustor liner and a joint portion between said transition inner duct and said turbine, and said transition outer duct is formed as an extraction flow passage for extracting the

fluid having flown in through said inlet openings to said recuperator.